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BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER	
AMINI, JAVID A	

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/044,168	RISING ET AL.	
	Examiner	Art Unit	
	Javid A. Amini	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments filed 6/24/05 have been fully considered but they are not persuasive.

Applicant on page 2 of the remarks line 15 argues that the Examiner's question does not fit under rejection 112, second paragraph as indefinite, e.g. "does Applicant's computerized method analyze the content of the multimedia prior to storage area or after the storage area?"

Examiner's comment: Examiner believes that the answer to the question is unclear/vague and simply asking Applicant to clarify the nature of the unclear subject, see next paragraph.

Examiner's comments on other questions: The method of graph rewriting contains rules and models (i.e. pre-defined template graphs), which are located in fig. 1, GCS 103. Examiner found the closest answer to the question from the specification as follows: the question is [What does occur to "validating the input graph" if there is no match with a template graph?] the answer is the invalid graph goes to "EXIT" see fig. 2. The next two questions [Is the graph rewriting exactly similar to the multimedia content?] the Examiner assumes the answer is "NO", because Applicant in fig. 1 at GCS 103 has his own rules and models. The next question is [Does the comparing scenario identify all objects for multimedia content?] The Examiner assumes the answer is "YES" because according to fig. 2 all objects are contained edges and nodes.

In respect to Examiner's comments associated with the questions above, the rejection of claims 1-27 under 35 U.S.C. 112, second paragraph has been withdrawn.

Applicant on pages 2-3 argues that the Examiner has not considered Applicant's claims in their entirety. Applicant emphasizes that the invention is directed toward graph rewriting. Applicant

provides the definition for the Graph rewriting i.e. the process of combining graphs, replacing nodes with graphs, replacing edges with more complex configurations, and generating series of "production steps" to move from one graph to another. Applicant on page 3, line 9 argues the reference Petrakis does not disclose and rearranging of an ARG after it is originally created from the medical image.

Examiner's reply: As well known in the art of *Computer Science,* the broad term "multimedia" in claim 1, line 4 can combine text, graphics, full-motion video, and sound into an integrated package. Applicant on the same page adds that the medical images are well known as being only still pictures and thus cannot be properly interpreted as multimedia data. Petrakis on page 438 under section 3.1 teaches that image content can be described indirectly through attributes (e.g., subject, speaker, etc.) or text (e.g., captions). Queries by image content require that, prior to storage, images are processed, and appropriate descriptions of their content are extracted and stored in the database. A person skill in the art would have been interpreted the image retrieval by content e.g. captions, speaker i.e. audio, subject i.e. video and etc. Therefore all the medical images are not only still pictures and thus can be properly interpreted as multimedia data.

Examiner's suggestion: Applicant may specify the type of multimedia content in claim 1. According to the Applicant's definition of the Graph rewriting [i.e. the process of combining graphs, replacing nodes with graphs, replacing edges with more complex configurations, and generating series of "production steps" to move from one graph to another]. Examiner refers Applicant to see e.g. fig. 1 on page 436 that illustrates a sketch of a face and its corresponding ARG. Examiner compares fig. 1 of the present invention (hereinafter referred as 01) with fig. 1 of the reference (hereinafter referred as 97), as follows: in 01 step 107 i.e. input graph, can be

interpreted as 97 (a) graph of a face i.e. input graph. In 01 step 101 is considered as GRS with rules and models e.g. predefine template graphs. Examiner interpretation: A rewrite system (e.g. Applicant refers it as GRS and the reference referred it as ARG) that is a set of equations over a given set of terms called rules that characterize a system of computation. Now back to the figures, in 01 step 103 the rules and models i.e. equivalent to 97 part (b), or at page 437 equations 1-4 defined some of the rules and the model under section 3.1 of the reference. The step of 109 at 01 is equivalent to 97, part (b).

Examiner's suggestion: Applicant claims a computerized method of graph rewriting but uses broad claim languages that can be easily anticipated by the application of the graph rewriting i.e. the work of Petrakis in the medical area. Applicant may overcome the reference by limiting the claim languages e.g. input graph (TV signal, Video signal etc.); multimedia content (Text, Audio, etc.) ; pre-defined template and method of validating (equation, geometry etc.).

For the reasons above the previous rejection is still maintained.

Examiner encourages Applicant to schedule an interview.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-27 rejected under 35 U.S.C. 102(b) as being anticipated by Euripides G.M. Petrakis, Member, IEEE, and Christos Faloutsos (hereafter refers as a "Euripides").

Claim 1.

Euripides discloses on page 435 under section 1, that shows a computerized method, quote from the reference: In medicine, in particular, a large number of images of various imaging modalities (e.g., computer tomography, magnetic resonance, etc.) are produced daily and used to support clinical decision making. A computerized method of graph rewriting, a graph having nodes representing entities and edges between the nodes representing relationships between entities, the method comprising: ***Euripides in figs. 1-2 illustrates graph rewriting of an image and its corresponding ARG (i.e. graph rewriting). Euripides on page 436 under section 2.1 discloses image descriptions are given in terms of object properties, and in terms of relationships between objects. The textbook approach to capture this information is the Attributed Relational Graphs (ARGs). In an ARG, graph nodes represent the objects, and arcs between such nodes represent the relationships between objects. Both nodes and arcs are labeled by attributes corresponding to properties (features) of objects and relationships, respectively.***

As claim invention discloses that comparing an input graph representing a description scheme for multimedia content with a set of predefined template graphs. ***Euripides on page 437 in first column and in fig. 2 discloses the specific features, which are used in ARGs, are derived from the raw image data and, depending on the application, can be geometric (i.e., independent of pixel values), statistical, or textural, or features specified in some transform domain (e.g., Fourier coefficients of object shapes). In the case of medical CT and MRI images used in this work, the set of features is given in Section 4.1. However, the proposed methodology is independent of any specific kind of features. The problem of retrieving images, which are similar to a given example, image is transformed into a problem of searching a database of***

stored ARGs: Given a query, its ARG has to be computed and compared with all stored ARGs. Matching between ARGs is a well-known problem and has been studied extensively in the computer vision literature. Specifically, matching a query and a stored graph is treated as a sub graph isomorphism problem.

As claim invention discloses in the last line of claim one that validating the input graph when there is a match with a template graph. ***Euripides on page 437 in second column discloses that the first term in Eq. (1) is the cost of matching (validating as the claim language specifies) associated nodes, while the second term is the cost of matching the relationships between such nodes. In our setting, only a subset of the objects in the stored image S needs to be matched. There is no cost if the data image contains extra objects; however, we assume that the cost is infinite if the data image is missing one of the objects of the query. COST is the cost of matching features of objects or features of relationships between associated objects. The distance between images Q and S is defined as the minimum distance computed over all possible mappings F(): see Eqs. 2-4. Similarity searching in an IDB of stored ARGs requires that all images within distance t must be retrieved. Specifically, we have to retrieve all the images S that satisfy the Eq. 4 condition.***

Claim 2.

The computerized method of claim 1, wherein the comparing uses a graph matching process. ***Euripides on page 436 under section 2.1 discloses image descriptions are given in terms of object properties, and in terms of relationships between objects. The textbook approach to capture this information is the Attributed Relational Graphs (ARGs). In an ARG, graph nodes represent the objects, and arcs between such nodes represent the relationships***

between objects. Both nodes and arcs are labeled by attributes corresponding to properties (features) of objects and relationships, respectively.

Claim 3.

The computerized method of claim 2, wherein the comparing comprises: creating adjacency matrices representing the input graph and the set of template graphs. ***Euripides on page 440 under section 4.1 and in second column teaches that additional features that could be used include the average gray-level and texture values, moments, or Fourier coefficients, etc., as object descriptors; relative size, amount of overlap-ping, or adjacency, etc., can be also used to characterize the relationships between objects.***

Claim 4.

The computerized method of claim 1 further comprising: evaluating the input graph against a set of pre-defined alphabet graphs; and applying a rule associated with a matching alphabet graph to the input graph, the rule represented by a rule graph and a set of morphism graphs. ***Euripides on page 437 in column one discloses matching a query and a stored graph is treated as a sub graph isomorphism problem. Examiner comment: the meaning of morphism is an abstraction of a function or mapping between two objects.***

Claim 5.

The computerized method of claim 4, wherein the evaluating uses a graph matching process. ***This step is inherent in the reference see figs. 1-3 of the Euripides.***

Claim 6.

The computerized method of claim 5, wherein the evaluating comprises: creating adjacency matrices for the input graph and the set of alphabet graphs. ***Euripides on page 439 in***

the first column discloses that the CAFIIR system proposes the "iconic index tree" to accelerate the search on facial images. One novelty of the system is that it can process "fuzzy" (i.e., subjective or in-complete) queries, through the so-called "fuzzification" technique, which translates the feature space to a fuzzy space. Also see page 440 the last paragraph before section 4.2 Euripides discloses set of alphabet graph or image translated or scaled with respect to each other.

Claims 7 and 8.

The computerized method of claim 4, wherein the applying comprises: performing pushout/pullback operations. *As Applicant on page 11 paragraph 0029 discloses that the two particular operations in algebraic graph grammars are suitable to build graph rewriting techniques for description scheme graphs: pushout and pullback. Pushouts and pullbacks can be thought of as sums and products, respectively.* ***Euripides on page 437 in Eqs. 1 –4 clearly shows the meaning of sums and products. Also in fig. 1b illustrates the pullback (also called the fiber product) is the limit of a diagram consisting of at least two morphisms r23: v2 → v3 and r12: v1 → v3 with a common codomain (A set within which the values of a function lie (as opposed to the range, which is the set of values that the function actually takes). Explicitly, the pullback of the morphisms r23 and r12 consists of an object v0 and two morphisms r01: v0 → v1 and r02: v0 → v3 for which the diagram. The categorical dual of a pullback is a called a pushout.***

Claim 9.

The computerized method of claim 8, wherein performing the pullback operation comprises: creating adjacency matrices representing smallest portions of the set of morphism graphs that map the input and rule graphs to the alphabet graph using pre-images of parts of the alphabet graph marked for change; and multiplying the adjacency matrix associated with the input graph by a transpose of the adjacency matrix associated with the rule graph. ***See rejection of claims 7-8 that applies to the rejection of this claim.***

Claim 10

See rejection of claim 1.

Claims 11-18

The rejections of claims 2-9 apply to the rejections of claims 11-18.

Claims 19-27

The rejections of claims 2-9 apply to the rejections of claims 19-27.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A. Amini whose telephone number is 571-272-7654. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 571-272-7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Javid A Amini
Examiner
Art Unit 2672

Javid Amini

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600